

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/JP2004/005550

International filing date (day/month/year)
19.04.2004

Priority date (day/month/year)
25.04.2003

International Patent Classification (IPC) or both national classification and IPC
G21K1.00

Applicant
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1 This opinion contains indications relating to the following items:

- ☐ Bo. No. I Basis of the opinion
- ☐ Bo. No. II Priority
- ☐ Bo. No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Bo. No. IV Lack of unity of invention
- ☐ Bo. No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Bo. No. VI Certain documents cited
- ☐ Bo. No. VII Certain defects in the international application
- ☐ Bo. No. VIII Certain observations on the international application

2 FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2004/005550

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
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International application No.
PCT/JP2004/005550

Box No. II Priority

1. ☒ The following document has not been furnished:
- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
 - ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).
- Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-5
Inventive step (IS)	Yes: Claims	
	No: Claims	1-5
Industrial applicability (IA)	Yes: Claims	1-5
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V.

1. The following documents are referred to in this communication:

- D1 : LIESENER J ET AL: "Multi-functional optical tweezers using computer-generated holograms" OPTICS COMMUNICATIONS, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, vol. 185, no. 1-3, 1 November 2000 (2000-11-01), pages 77-82, XP004219458 ISSN: 0030-4018
- D2 : US 6 416 190 B1 (CURTIS JENNIFER E ET AL) 9 July 2002 (2002-07-09)
- D3 : KORDA PAMELA ET AL: "Nanofabrication with holographic optical tweezers" REVIEW OF SCIENTIFIC INSTRUMENTS, AMERICAN INSTITUTE OF PHYSICS, US, vol. 73, no. 4, April 2002 (2002-04), pages 1956-1957, XP012039995 ISSN: 0034-6748
- D4 : DUFRESNE ERIC R ET AL: "Computer-generated holographic optical tweezer arrays" REVIEW OF SCIENTIFIC INSTRUMENTS, AMERICAN INSTITUTE OF PHYSICS, US, vol. 72, no. 3, March 2001 (2001-03), pages 1810-1816, XP012039046 ISSN: 0034-6748
- D5 : CURTIS J E ET AL: "Dynamic holographic optical tweezers" OPTICS COMMUNICATIONS, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, vol. 207, no. 1-6, 15 June 2002 (2002-06-15), pages 169-175, XP004362024 ISSN: 0030-4018
- D6 : US 2003/047676 A1 (GRIER DAVID G ET AL) 13 March 2003 (2003-03-13)

2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Document D1 already discloses (see D1, page 78, "2. Basic tweezer setup", figure 1) an apparatus for handling a minute object by using optical tweezers which comprises a light source (Ar⁺-Laser), a first base to form a hologram with light emitted from the light source (LCD for holographic beam shaping), a second base (slide) that holds a liquid (implicit from the use of water dipping lens MO), and wherein the hologram formed in the liquid on the second base is used as an optical tweezers to handle the minute object in the liquid (1 μ m silica spheres suspended in water). In consequence the subject-matter claimed in claim 1 is not new.

Analogously the subject-matter claimed in claim 5 is not new with regard to the disclosure of document D1.

3. Each of documents D2 - D6 is of similar relevance like D1 with regard to lack of novelty of claims 1 and 5.
4. Dependent claims 2 - 4 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).

The additional features are either already known from one of documents D1 - D6 or can be derived from documents D1 - D6.

5. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 - D6 is not mentioned in the description, nor are these documents identified therein.
6. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).